



A.D. 1854 N° 2383.

S P E C I F I C A T I O N

OF

FREDERICK SMITH.

FURNACES.

L O N D O N :

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1855.



A.D. 1854 N° 2383.

Furnaces.

LETTERS PATENT to Frederick Smith, of York Street, Lambeth, in the County of Surrey, Oven Builder, for the Invention of “**AN IMPROVED CONSTRUCTION OF SMOKE-CONSUMING FURNACE.**”

Sealed the 5th January 1855, and dated the 9th November 1854.

PROVISIONAL SPECIFICATION left by the said Frederick Smith at the Office of the Commissioners of Patents, with his Petition, on the 9th November 1854.

I, FREDERICK SMITH, of York Street, Lambeth, in the County of Surrey,
5 Oven Builder, do hereby declare the nature of the said Invention for “**AN IMPROVED CONSTRUCTION OF SMOKE-CONSUMING FURNACE**” to be as follows :—

In this arrangement of furnace the bars are solid as usual, but they increase in breadth as they approach the bridge, the object being to make the windage greater near the door than at the bridge. Currents of air pass up flues made
10 in the side walls of the furnace, and thereby become heated; the air then makes its exit at a horizontal opening or openings extending across the roof of the furnace. The flame of the furnace is deflected by the combined action of the projecting cheeks at the sides of the horizontal air-vent and the descending current of hot air, and the passing volume of smoke given off
15 from the burning fuel is intercepted and consumed.

The deflecting checks I prefer to make of hollow iron, and I cause water to circulate therein, for the purpose (mainly) of preventing them from burning out rapidly. The cheeks may, however, be formed of fire brick.

Smith's Improved Construction of Smoke-Consuming Furnace.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said Frederick Smith in the Great Seal Patent Office on the 5th May 1855.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, **FREDERICK SMITH**, of York Street, Lambeth, in the County of Surrey, Oven Builder, 5 send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Ninth day of November, in the year of our Lord One thousand eight hundred and fifty-four, in the eighteenth year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said 10 Frederick Smith, Her special license that I, the said Frederick Smith, my executors, administrators, and assigns, or such others as I, the said Frederick Smith, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and 15 vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "**AN IMPROVED CONSTRUCTION OF SMOKE-CONSUMING FURNACE**," upon the condition (amongst others) that I, the said Frederick Smith, by an instrument in writing under my hand and seal, should particularly describe and ascertain the nature of the said Invention, 20 and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that I, the said Frederick Smith, do hereby declare the nature of my said Invention, and in what manner the same is to be per- 25 formed, to be particularly described and ascertained in and by the following statement, reference being had to the Drawing hereunto annexed, and to the letters and figures marked thereon (that is to say):—

The chief object of this Invention is so to construct the furnaces of bakers' ovens, that the emission of smoke therefrom when the furnace is in full opera- 30 tion will be wholly or in great part avoided. The arrangement of air flues which I employ for this purpose may, however, be applied with advantage to steam boiler and other furnaces.

In the accompanying Drawing, Fig. 1 is a longitudinal section of my improved smoke-consuming furnace; Fig. 2 is a sectional plan view of the same, 35 shewing its connection with a baker's oven; and Fig. 3 is a cross section, taken in the line 1, 2, of Fig. 2. The sides and roof of the fire-place, it will be seen, are lined with firebrick *a, a*, behind which air flues are formed, for the

FIG. 1.

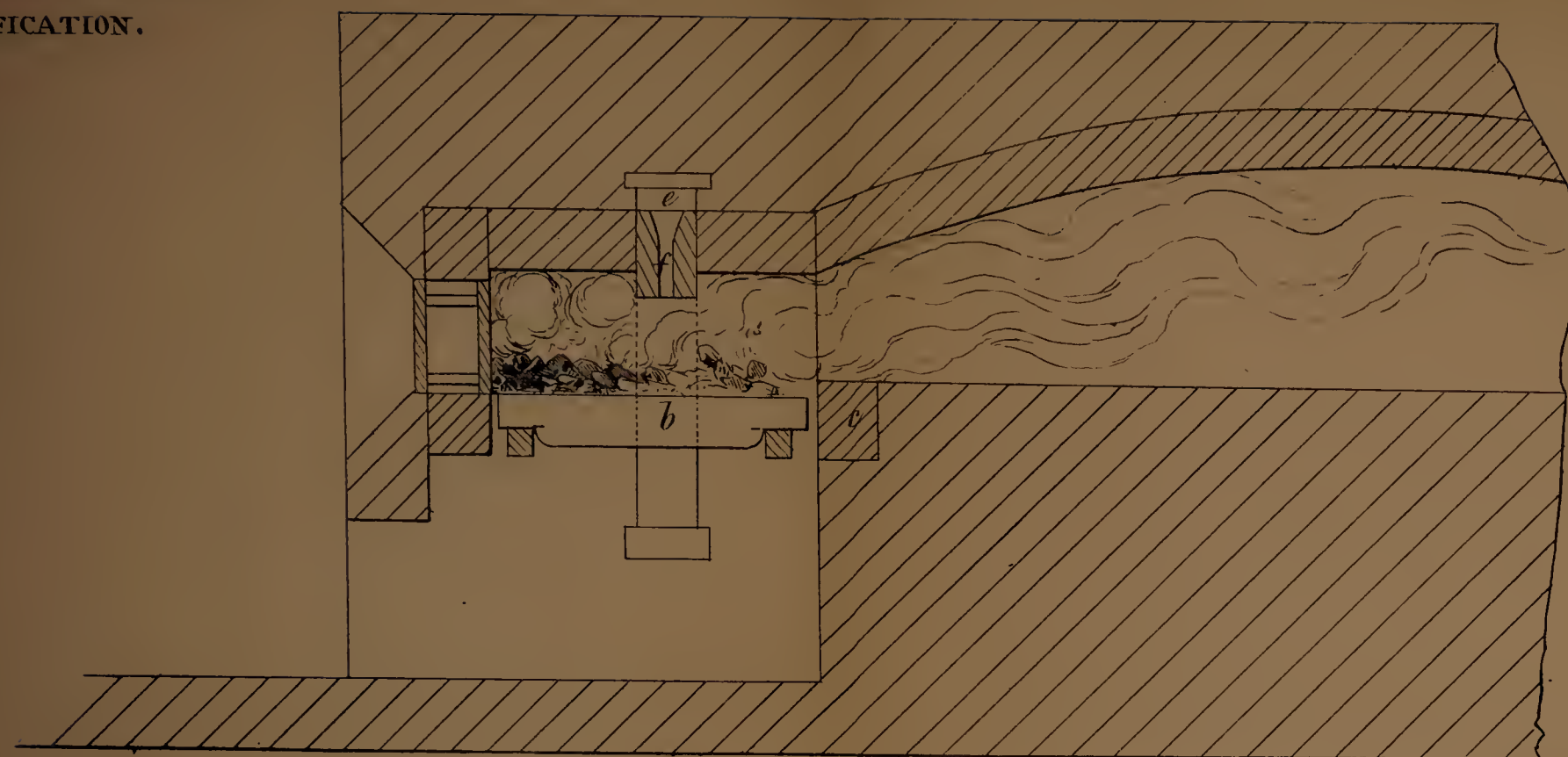


FIG. 3.

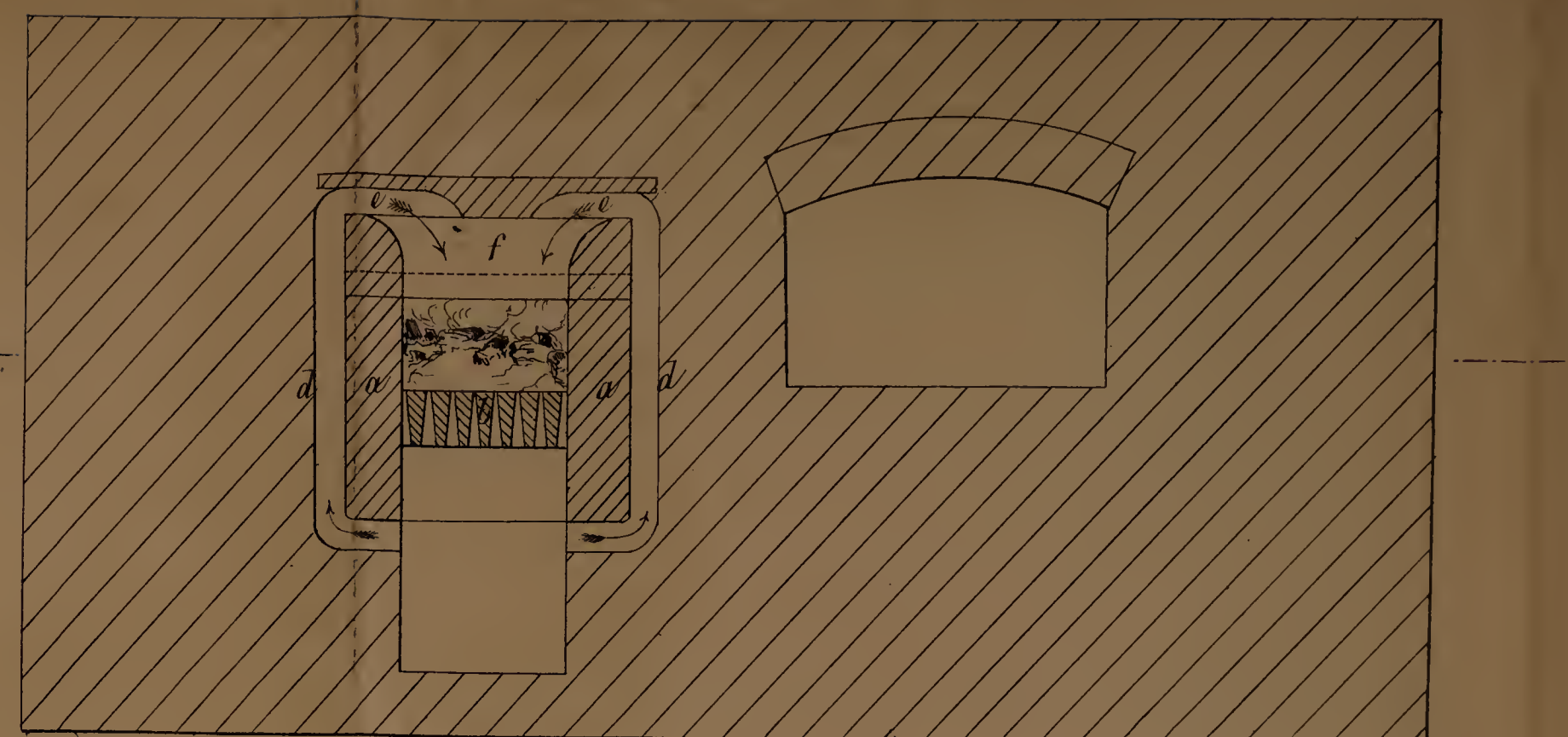
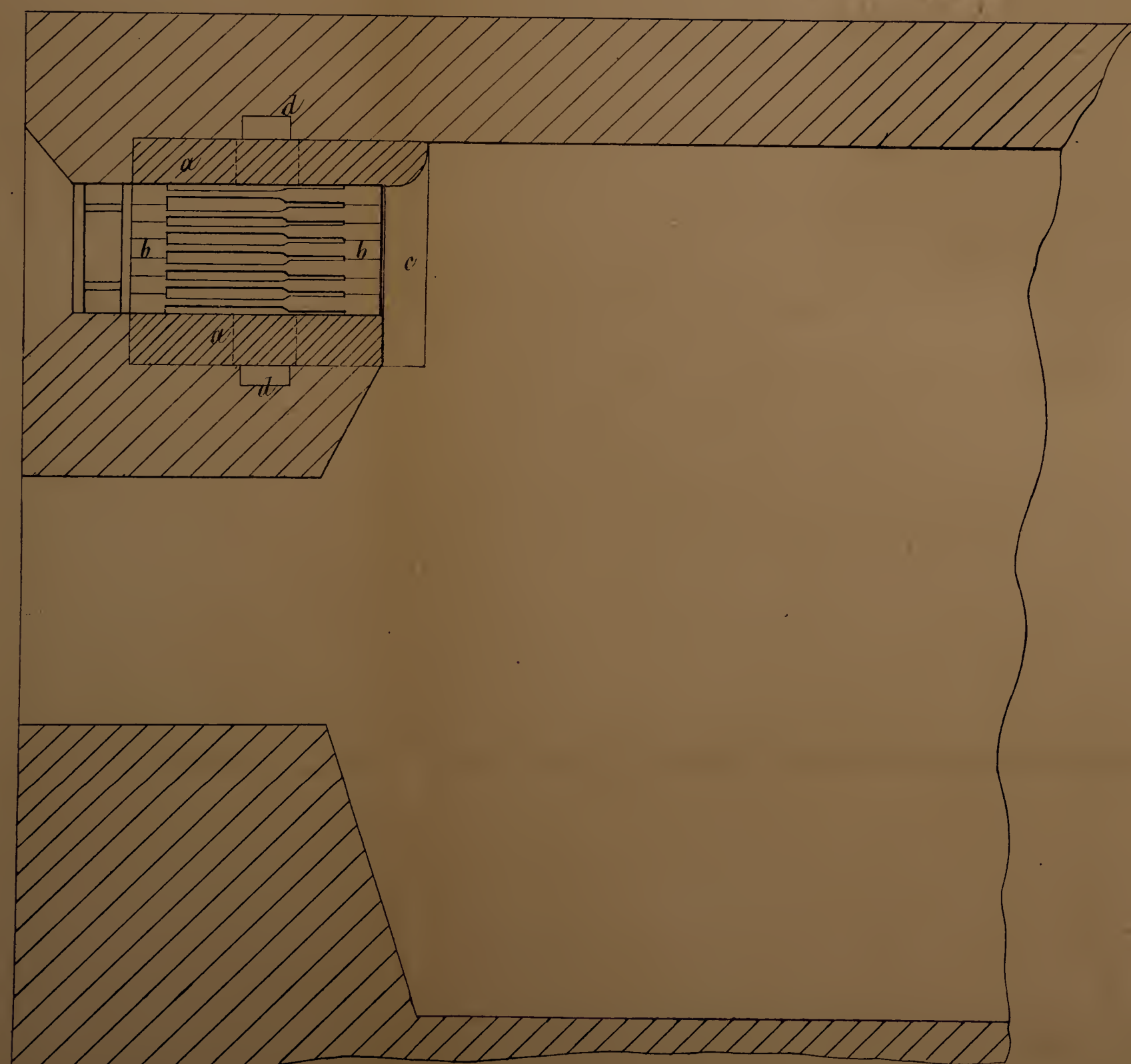


FIG. 2.



Scale $\frac{1}{8}^{th}$



The filed drawing is colored.

Smith's Improved Construction of Smoke-Consuming Furnace.

purpose of drawing in atmospheric air, and directing it when heated in a stream or streams on to the top of the incandescent fuel.

The fire is supported upon solid fire bars *b, b*, which increase in breadth as they approach the bridge *c*, the object being to make the windage greater near
5 the door than at the bridge, and by that means to supply the maximum quantity of air to the fresh fuel. Currents of air enter the side flues *d, d*, in the walls of the furnace from the ash-pit, and in passing upwards to a horizontal flue *e* become heated; the air then makes its escape at a horizontal opening or openings *f*, formed in and extending across the roof of the furnace. At the
10 sides of this opening are cheeks, which project downwards into the furnace, for the purpose of guiding the descending current of hot air in a vertical direction, or nearly so, on to the flame and heated gases as they pass towards the bridge. These cheeks will also, by offering an obstruction to the forward progress of the gases of combustion, assist in deflecting them on to the bright coals near
15 the bridge *c*, and thus the combustion of the smoke generated in the furnace after every fresh charge of coals will be insured.

The deflecting cheeks, instead of being formed of fire bricks, as shewn in the Drawing, I propose in some cases to construct of hollow iron, and when
20 adopting this material I cause a current of water to circulate through the cheeks by any well-known arrangement, mainly for the purpose of preventing their rapid destruction from the action of the flame upon them.

Having now set forth the nature of my Invention of "An Improved Construction of Smoke-Consuming Furnace," and explained the manner of carrying the same into effect, I wish it to be understood that under the above
25 in part recited Letters Patent I claim, the application to furnaces of the means above described, whereby I am enabled to intercept the smoke on its passage to the bridge of the furnace, and effect the combustion of the same in the fire-place.

In witness whereof, I, the said Frederick Smith, have hereunto set my
30 hand and seal, the Twenty-sixth day of February, in the year of our Lord One thousand eight hundred and fifty-five.

F. SMITH. (L.S.)

LONDON :

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